Public Health – Seattle and King County

Sexually Transmitted Diseases Epidemiology Report, 2003

Public Health – Seattle and King County
2003 STD Epidemiology Report

Data sources

Disease data:

The three sexually transmitted infections described in this report are notifiable diseases in Washington State. Medical providers and laboratories are required by law to report all laboratory confirmed cases of these infections to Public Health – Seattle & King County. A copy of the case report form is included in Appendix A. For this report, yearly infection totals are based on year of diagnosis, rather than year of report.

Population data:

Incidence rates were calculated using population estimates provided by the Washington State Office of Financial Management for intercensal years, and U.S. census data for 2000.

Population estimates for men who have sex with men (MSM), and well as HIV positive and negative MSM, were provided by the PHSKC HIV/AIDS Epidemiology Unit.

Data limitations: Notifiable disease data are subject to several limitations. In some cases, considerable differences in numbers and rates of infection between subgroups are attributable in large part to screening and testing practices. For example, the rate of chlamydial infection in King County is substantially higher among women than men, reflecting national recommendations that young women be screened for chlamydia annually, and the absence of corresponding recommendations for young men.

While chlamydial infection, gonorrhea, and syphilis are all notifiable diseases in Washington State, these data are subject to underreporting by physicians and laboratories. Additionally, undiagnosed infections are not reported, and so infections which are often experienced with no symptoms, such as chlamydia, may exist at higher levels in the population than notifiable disease data indicate.

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Chlamydial Infection

In 2003, 5189 cases of chlamydial infection were reported among King County residents, resulting in a crude incidence of 291.6 per 100,000 (Table 1). Recommended routine chlamydial screening for young women results in many more cases of chlamydia being detected among women then men. However, the true incidence of disease is probably similar in men and women. In 2003, 3441 and 1748 cases of chlamydia were reported among women and men, respectively, for incidences of 385.1 cases per 100,000 women, and 197.4 cases per 100,000 men.

Incidence of chlamydial infection was lowest for whites and highest for African Americans among both women and men in King County, with rates among African American women and men being 6 and 8 times higher, respectively, than rates among white women and men (Table 2). The age groups most affected by chlamydial infection were 15-19 and 20-24 years for women, and 20-24 and 24-29 years among men, likely reflecting increased physiologic susceptibility to chlamydial infection among young women, as well as age-disparate sexual partnerships between younger women and older men.

Chlamydia incidence among 15-29 year old women in King County has increased slowly over the past 6 years, following a decline in rates from 1992 through 1997 (Figure 1). The gradual increase in incidence locally is in contrast the sharp increase in rates in this sex and age group at a national level; rates among 15-29 year old U.S. women have more than doubled since 1997 (perhaps reflecting increased screening on a national level over this time period). Chlamydia incidence among men, both overall, and in the 15-29 age group, has followed a similar pattern of a decrease from 1992 to 1996, with an increase in incidence from 1997 through 2003 (Tables 3 and 4).

Figures 2 and 3 display trends in chlamydial infection by age and race over time. Both figures include women only, given that detection of infection is much more complete among women. Chlamydial incidence has consistently been much higher among 15-19 and 20-24 year old women than women of other ages in King County (Figure 2). However, in the early 1990s, the disparity in incidence between these groups (2987.1 per 100,000 for 15-19 year olds vs. 2017.4 per 100,000 among 20-24 year olds) was much greater than it was in 2003 (2217.1 per 100,000 vs. 2139.2 per 100,000, respectively), reflecting a decrease in incidence over time among 15-19 year olds, coupled with a small increase among 20-24 year olds. African American women have consistently had the highest rates of chlamydial infection over time, followed by Native Americans; both groups experienced large increases in rates between 1999 (1998 for Native Americans) and 2000, followed by a decrease in incidence in 2002. White and asian/pacific islander women have had similar, lower rates over time.

Over time, the proportion of women diagnosed with chlamydia as part of a routine exam has increased, while the proportion diagnosed as a result of seeking treatment for symptoms has decreased (Figure 4). The same pattern has occurred among men (Figure 5), with almost one quarter of men being diagnosed as part of a routine exam in 2003, and less than half diagnosed as a result of symptoms.

Table 1: Number of Reported Cases and Chlamydia Incidence, King County, WA, 2003

		Cases	Incidence per 100,000 population
Sex			
	Women	3441	385.1
	Men	1748	197.4
Total cases		5189	291.6

Table 2: Number of Reported Cases and Chlamydia Incidence in Men and Women, by Age and Race King County, WA, 2003

		Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
		Women (N=3441)		Men (N=1748)	
Race*¶					
	White	1406	245.0	728	127.1
	Black	686	1553.6	480	1031.9
	Nat Am	86	1205.4	16	222.4
	Asian/PI	374	395.8	120	136.7
	Other	82		45	
	Multiple	137		21	
	Unknown	670		338	
Age*	0-9 years	2	1.9	0	0.0
	10-14 years	56	102.8	3	5.3
	15-19 years	1196	2217.1	233	419.3
	20-24 years	1344	2139.2	583	918.4
	25-29 years	458	690.5	361	518.3
	30-34 years	208	284.3	240	304.9
	35-44 years	134	92.1	231	154.1
	45-55 years	32	22.9	70	51.4
	>=56 years	4	2.1	11	6.9
	Unknown	7		16	

* Cases with unknown race or age were included in race and age specific rates after being distributed among race/age categories based on the distribution of cases with known race or age. In 2003, among women, 670 case reports were missing race, and 7 missing age, and among men, 338 case reports were missing race, and 16 were missing age.

¶ Race specific rates exclude cases reported with "multiple" or "other" races.

Table 3: Number of Reported Chlamydia Cases and Incidence among Men and Women King County, WA, 1992-2003

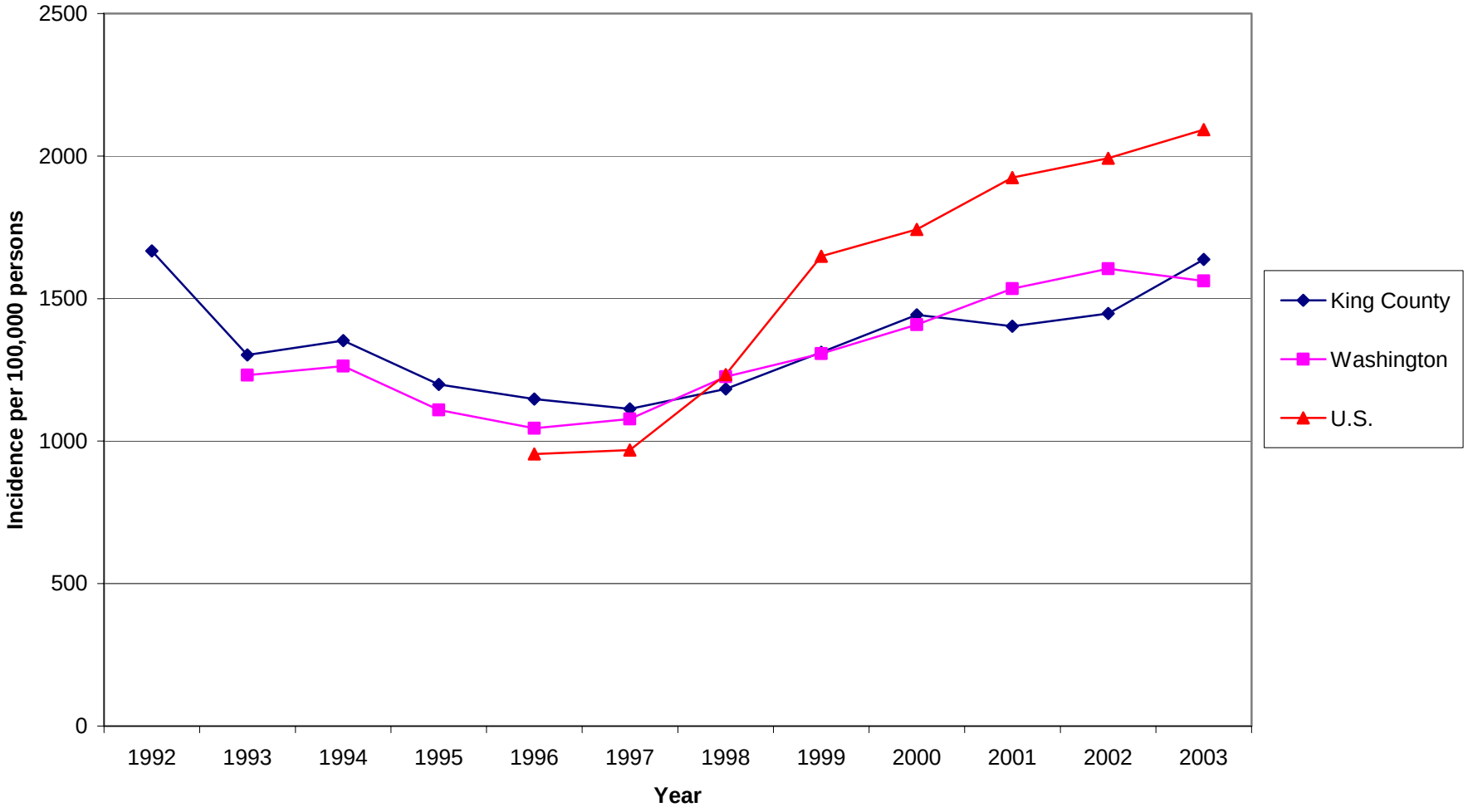
	Women		Men		Total	
Year	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
1992	3227	403.9	1029	131.9	4256	269.5
1993	2566	316.2	813	102.3	3379	210.4
1994	2745	334.8	811	100.8	3556	218.9
1995	2414	291.5	804	98.7	3218	195.9
1996	2359	282.3	880	106.8	3239	195.2
1997	2247	265.9	905	108.4	3152	187.7
1998	2454	286.8	1073	126.7	3527	207.2
1999	2690	311.4	1336	156.0	4026	234.1
2000	3004	344.3	1441	166.7	4445	255.9
2001	2862	324.1	1390	158.8	4252	241.8
2002	3007	337.4	1468	166.2	4475	252.2
2003	3441	385.1	1748	197.4	5189	291.6

Table 4: Number of Reported Chlamydia Cases and Incidence among Men and Women ages 15-29, King County, WA, 1992-2003

	Women, ages 15-29		Men, ages 15-29		Total, ages 15-29	
Year	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
1992	2416	1391.8	854	479.4	3270	929.6
1993	2011	1160.2	688	385.5	2699	767.3
1994	2221	1289.8	632	355.3	2853	815.0
1995	1983	1148.5	629	351.4	2612	743.0
1996	1928	1107.9	658	364.0	2586	728.9
1997	1920	1092.8	636	348.3	2556	713.3
1998	2063	1159.9	773	417.4	2836	781.2
1999	2306	1291.4	897	482.4	3203	878.8
2000	2569	1429.6	990	529.7	3559	970.8
2001	2528	1397.4	910	484.3	3438	932.1
2002	2630	1441.1	1026	542.1	3656	983.4
2003	2998	1634.0	1188	623.7	4186	1119.5

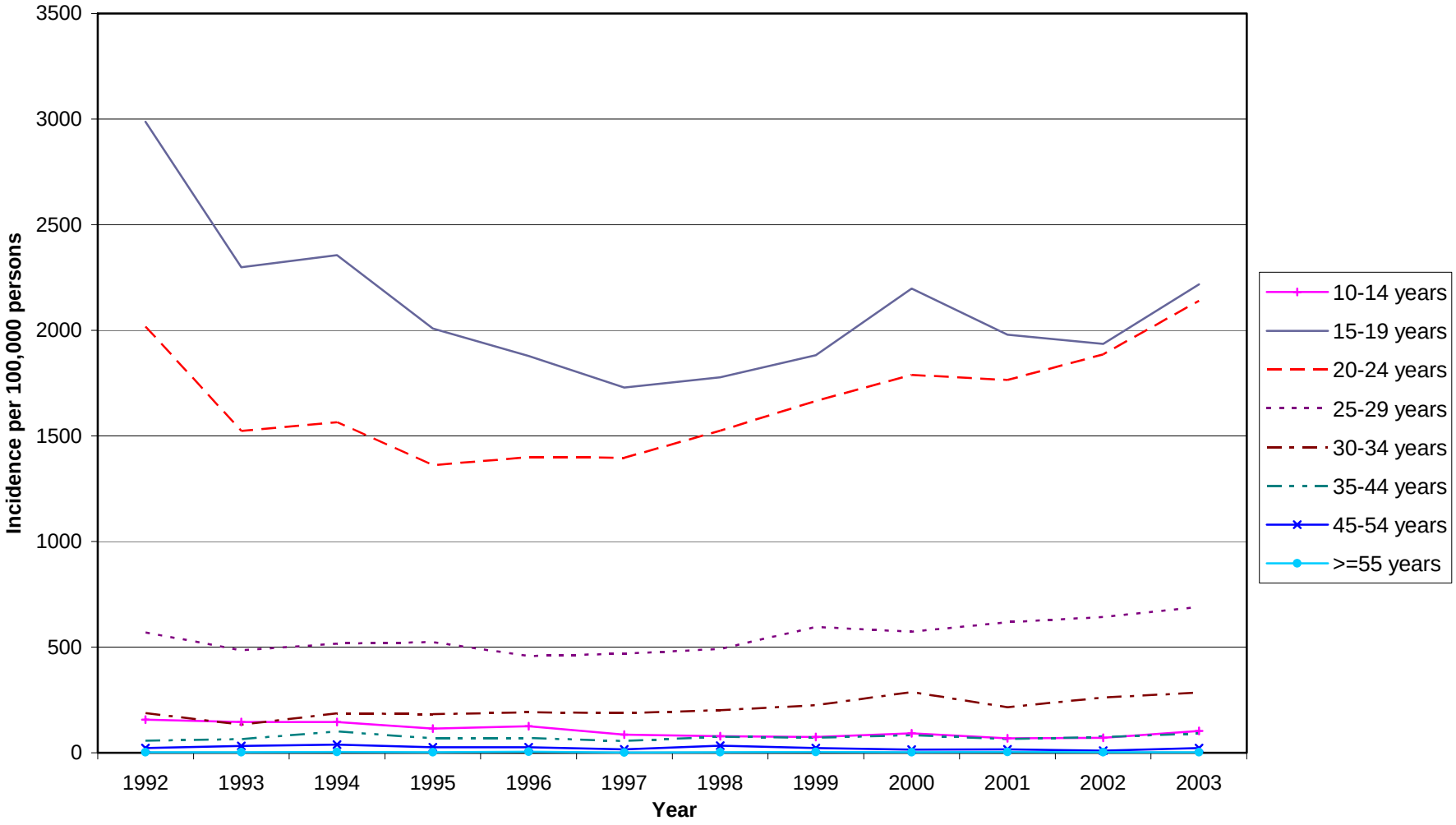
* Cases with unknown age were included age specific counts and rates after being distributed among age categories based on the distribution of cases with known age.

Figure 1: Chlamydia Incidence among Women ages 15-29*, 1992-2003
King County, Washington State, and U.S.



* Cases with unknown age were distributed according to annual age distributions among cases with known age and included in age-specific

Figure 2: Chlamydial Infection by Age* Among Women
King County, WA, 1992-2003

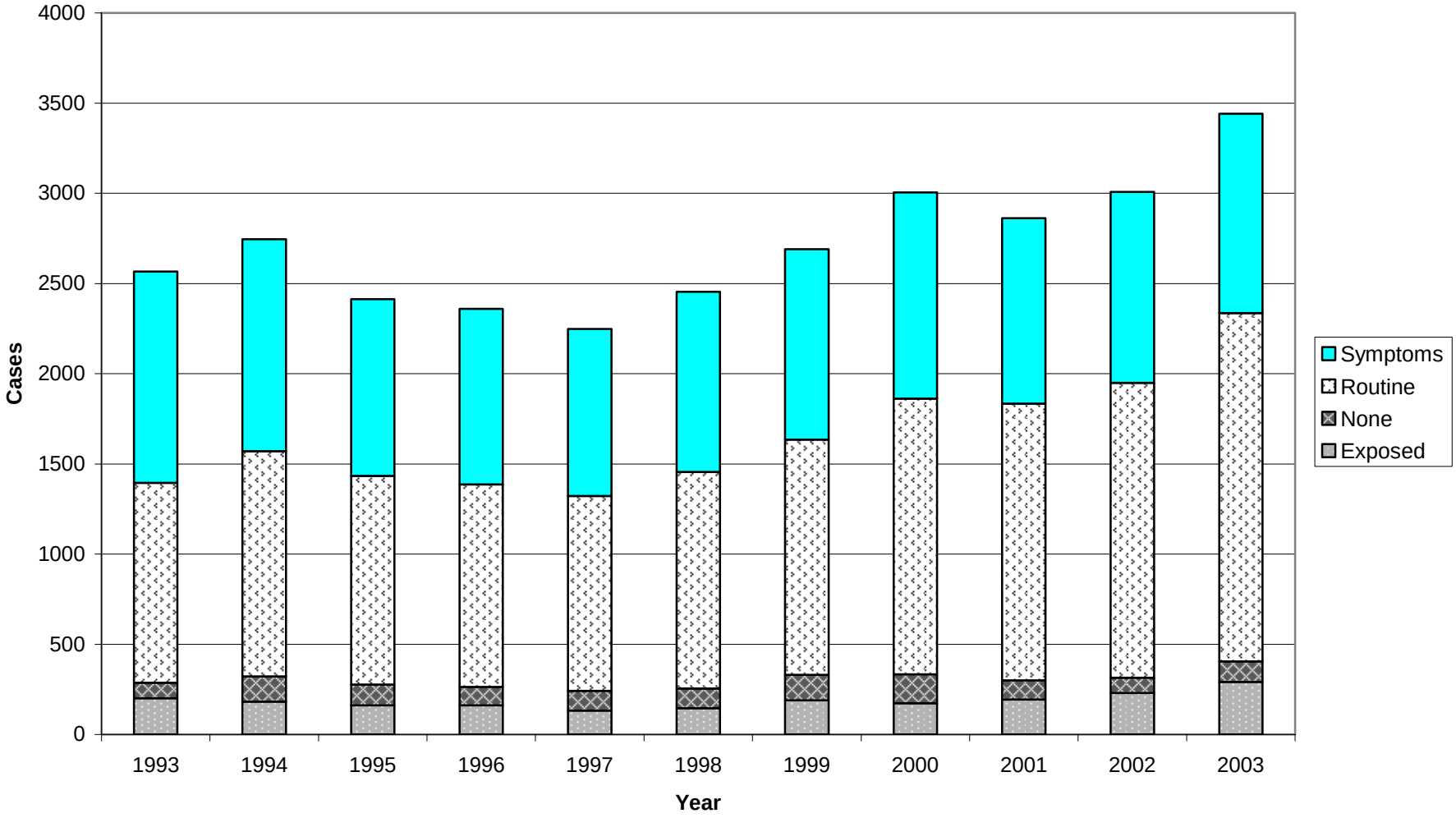


* Cases with unknown age were distributed according to annual age distributions among cases with known age and included in age-specific rates.

Figure 3: Chlamydial Infection by Race Among Women Ages 15-29*
King County, WA, 1992-2003

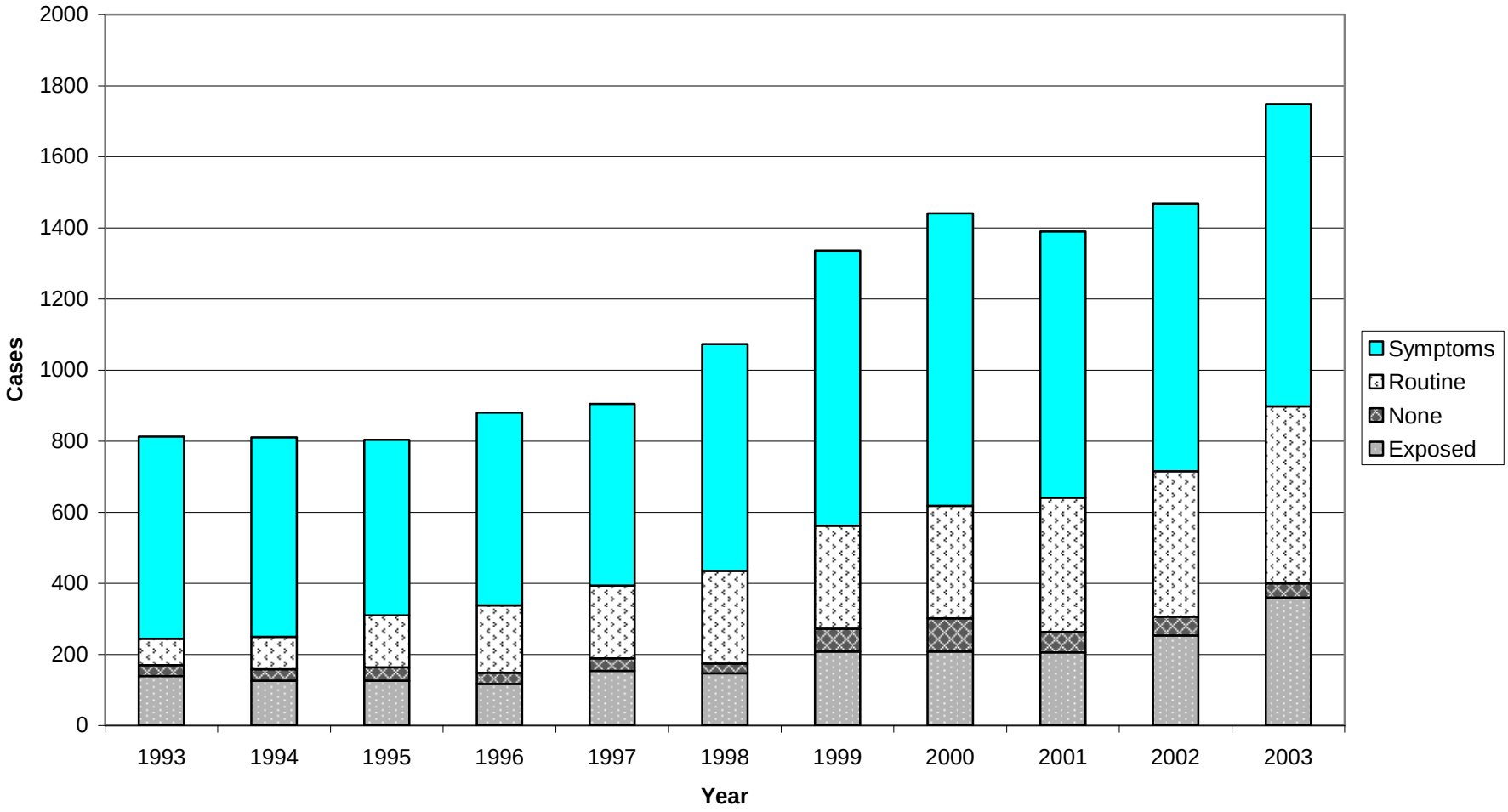
* Cases with unknown race and age were distributed according to annual race and age distributions among cases with known race and age and included in age-specific rates.

Figure 4: Reason for Visit among Women reported with Chlamydial infection
King County, WA, 1993-2003



* Reason for visit is completed by providers on the case report form.

Figure 5: Reason for Visit* among Men reported with Chlamydial infection
King County, WA, 1993-2003



* Reason for visit is completed by providers on the case report form.

Gonorrhea

In 2003, 1349 cases of gonorrhea were reported among King County residents, for a crude incidence of 75.8 per 100,000 (Table 5). In contrast to chlamydial infection, gonorrhea rates are higher among men (106.8 per 100,000) than among women (45.1 per 100,000). This likely reflects the higher incidence of gonorrhea in men who have sex with men (MSM) than in heterosexual men and women in King County.

Gonorrhea incidence in African American women was 13 times the incidence among white women in 2003 (Table 6). This racial disparity, although still substantial, was less pronounced in men (African American incidence was 6.3 times white incidence), probably due to the fact that MSM diagnosed with gonorrhea in King County are disproportionately white. Numbers of cases in other race groups were small in 2003, making comparisons difficult. In women, gonorrhea incidence was highest in the 15-19 and 20-24 year old age groups, while in men, incidence was highest (and similar) for men in the 20-24, 24-29, and 30-34 year old groups. Again, this difference between men and women is most likely due to the influence MSM, with MSM being diagnosed at older ages than heterosexual men.

Figure 6 displays gonorrhea incidence in 15-29 year old women, in order to best demonstrate trends in heterosexual gonorrhea. In King County, gonorrhea incidence in this group has decreased from a high of 452.6 per 100,000 in 1992 to 164.4 per 100,000 in 2003, with a slight increase between 1998 and 2001, followed by a decline in rates. In contrast, after declining from 1992 through 1997, rates in the U.S. rose and have remained fairly stable over the past 5 years. The U.S. incidence in 15-29 year old women (501.4 per 100,000) was 3 times the King County incidence (164.4 per 100,000) in 2003.

The proportion of gonorrhea cases accounted for by women has decreased over time, from 46% in 1992 to 29% in 2003 (Figure 7), again reflecting the increasing influence of MSM on gonorrhea epidemiology in King County. Figures 8 and 9 include women only to better demonstrate trends among heterosexuals. Age patterns observed in gonorrhea incidence for 15-29 year old women are similar to those observed for chlamydial infection (Figure 8). Gonorrhea incidence was much higher among 15-19 year old than 20-24 year old women in the early 1990s, while for the past several years, incidences both groups have been similar, with larger decreases in rates over time observed among 15-19 year olds. While gonorrhea incidence is much higher among African American than white women in King County, incidence in African American women has decreased over time to a greater degree than among white women, with the exception of the period between 1999 and 2001 (Figure 9).

The proportion of cases diagnosed with gonorrhea as a part of a routine exam increased, and the proportion diagnosed because of treatment seeking for symptoms decreased, from 1992 to 2003 (Figures 10 and 11). However, patterns were somewhat different across men and women. In women, the decrease in the proportion seeking treatment for symptoms was fairly small, and the proportion diagnosed because they were contacts to a gonorrhea case also declined over time. In men, the decline in the proportion diagnosed because of symptoms was greater, and there was no corresponding decrease in the proportion diagnosed as part of a contact investigation.

Table 5: Number of Reported Gonorrhea Cases and Gonorrhea Incidence, King County, WA, 2003

		Cases	Incidence per 100,000 population
Sex			
	Men	946	106.8
	Women	403	45.1
Total cases		1349	75.8

Table 6: Number of Reported Gonorrhea Cases and Incidence, in Men and Women, by Age and Race, King County, WA, 2003

		Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
		Women (N=403)		Men (N=946)	
Race*†					
	White	141	23.4	491	82.0
	Black	145	312.5	252	518.0
	Nat Am	13	173.4	2	26.6
	Asian/PI	23	23.2	27	29.4
	Other	4		19	
	Multiple	15		7	
	Unknown	62		148	
Age*	0-9 years	0	0.0	0	0.0
	10-14 years	3	5.5	0	0.0
	15-19 years	112	208.2	36	64.2
	20-24 years	135	215.5	163	254.4
	25-29 years	53	80.1	169	240.4
	30-34 years	41	56.2	177	222.8
	35-44 years	45	31.0	280	185.1
	45-55 years	11	7.9	96	69.8
	>=56 years	1	0.5	24	14.9
	Unknown	2		1	

* Cases with unknown race or age were included in race and age specific rates after being distributed among race/age categories based on the distribution of cases with known race or age. In 2003, among women, 62 case reports were missing race, and 2 missing age, and among men, 148 case reports were missing race, and 16 were missing age.

† Race specific rates exclude cases reported with "multiple" or "other" races.

Table 7: Number of Reported Gonorrhea Cases and Incidence among Men and Women King County, WA, 1992-2003

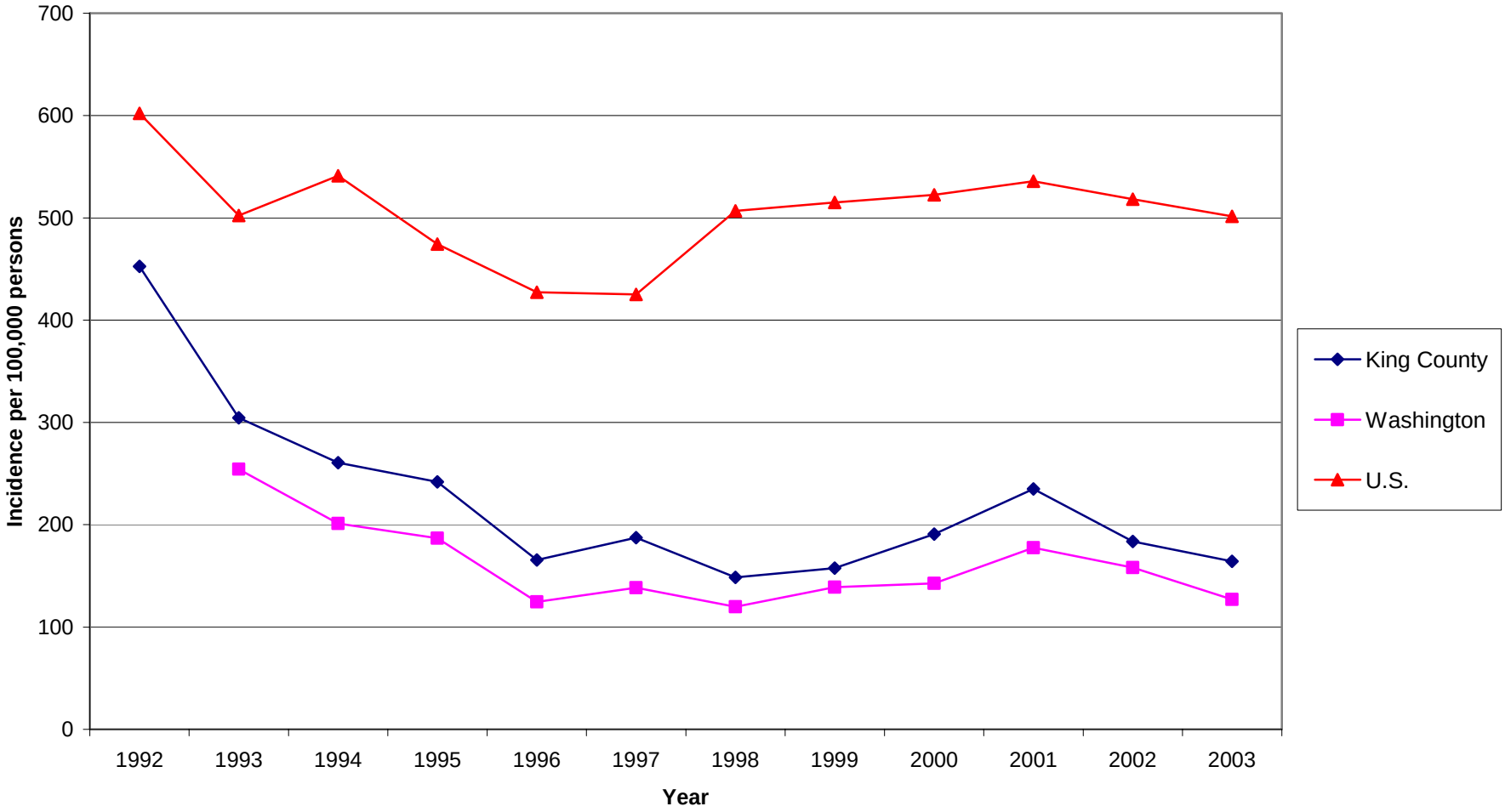
	Women		Men		Total	
Year	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
1992	970	121.4	1143	146.5	2113	133.8
1993	648	79.8	879	110.6	1527	95.1
1994	541	66.0	675	83.9	1216	74.9
1995	517	62.4	763	93.7	1280	77.9
1996	354	42.4	559	67.9	913	55.0
1997	396	46.9	519	62.2	915	54.5
1998	324	37.9	656	77.5	980	57.6
1999	342	39.6	605	70.7	947	55.1
2000	452	51.8	775	89.7	1227	70.6
2001	564	63.9	984	112.4	1548	88.0
2002	428	48.0	1025	116.1	1453	81.9
2003	403	45.1	946	106.8	1349	75.8

Table 8: Number of Reported Gonorrhea Cases and Incidence among Men and Women ages 15-29,* King County, WA, 1992-2003

	Women, ages 15-29		Men, ages 15-29		Total, ages 15-29	
Year	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
1992	786	452.6	742	416.5	1528	434.3
1993	528	304.7	510	285.7	1038	295.0
1994	449	260.8	407	228.9	856	244.6
1995	417	241.7	410	229.5	828	235.5
1996	288	165.5	291	161.2	579	163.3
1997	329	187.3	243	132.9	572	159.6
1998	264	148.6	318	172.0	583	160.6
1999	281	157.5	297	159.5	578	158.6
2000	343	190.7	304	162.6	647	176.4
2001	425	234.9	422	224.6	847	229.7
2002	335	183.6	442	233.5	777	209.0
2003	301	164.3	368	193.2	669	179.0

* Cases with unknown age were included age specific counts and rates after being distributed among age categories based on the distribution of cases with known age.

Figure 6: Gonorrhea Incidence among Women ages 15-29, 1992-2003
King County, Washington State, and U.S.



* For the U.S. and King County, cases with unknown age were distributed according to annual age distributions among cases with known age and included in age-specific rates.

Figure 7: Reported Gonorrhea Cases Among Men and Women
King County, WA, 1992-2003

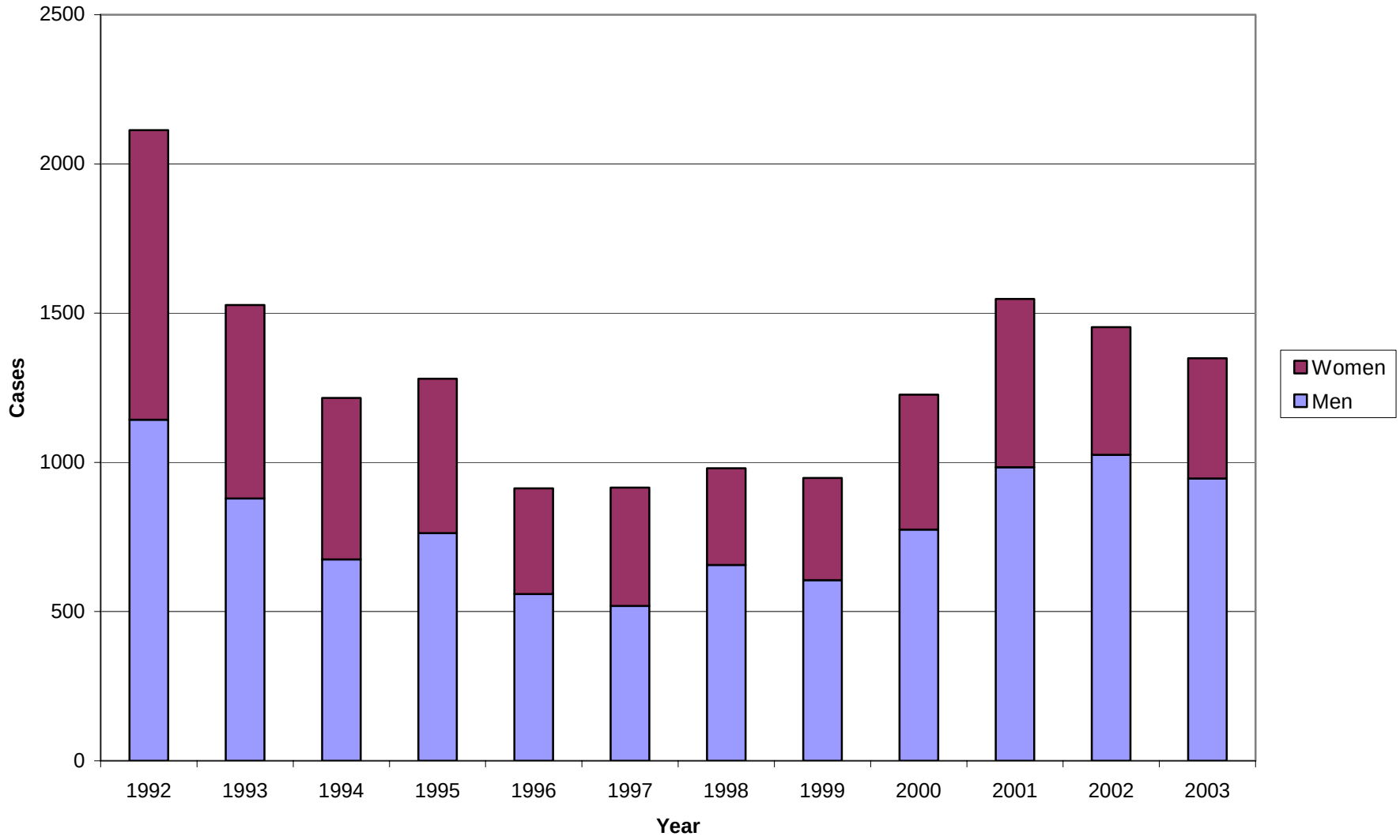
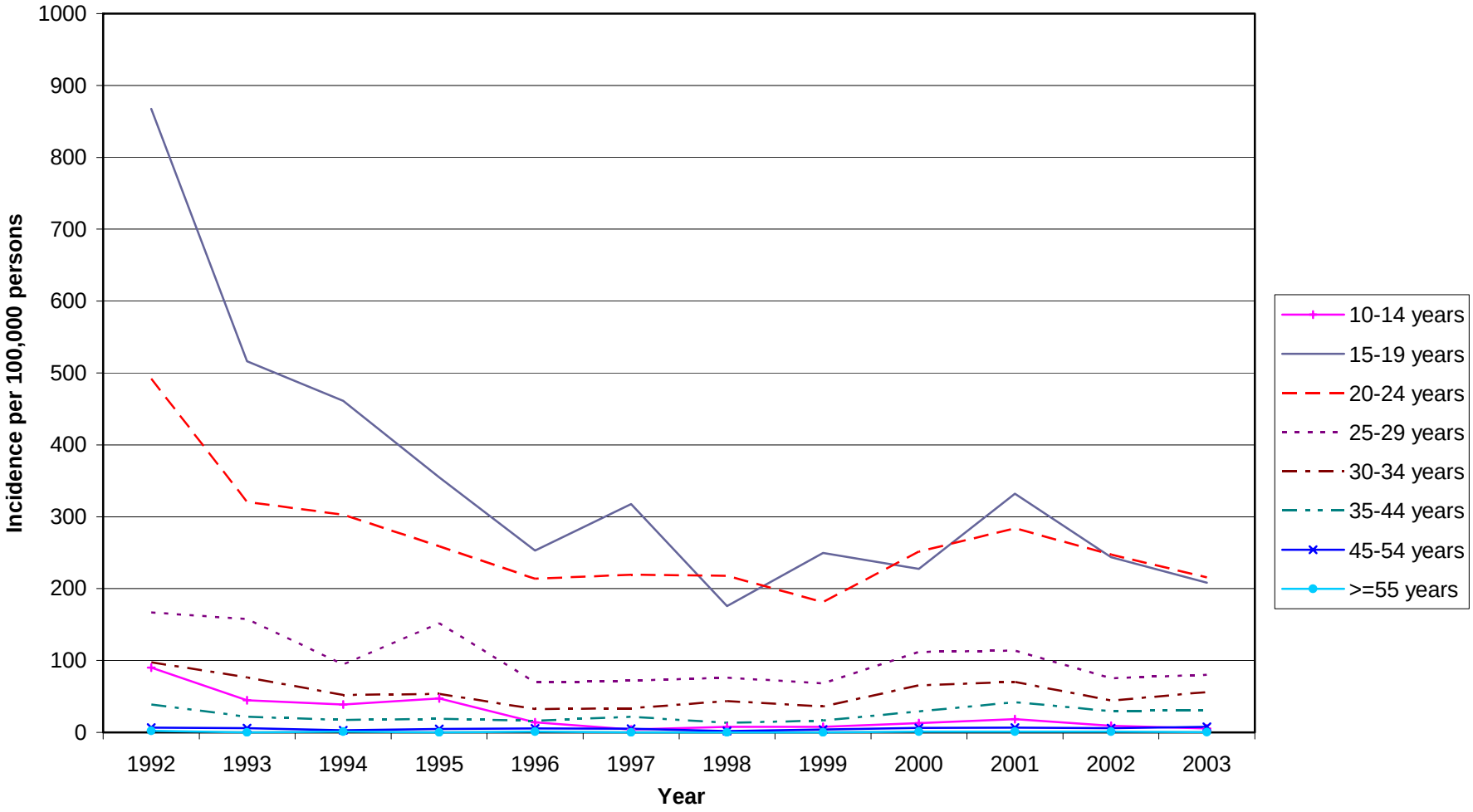


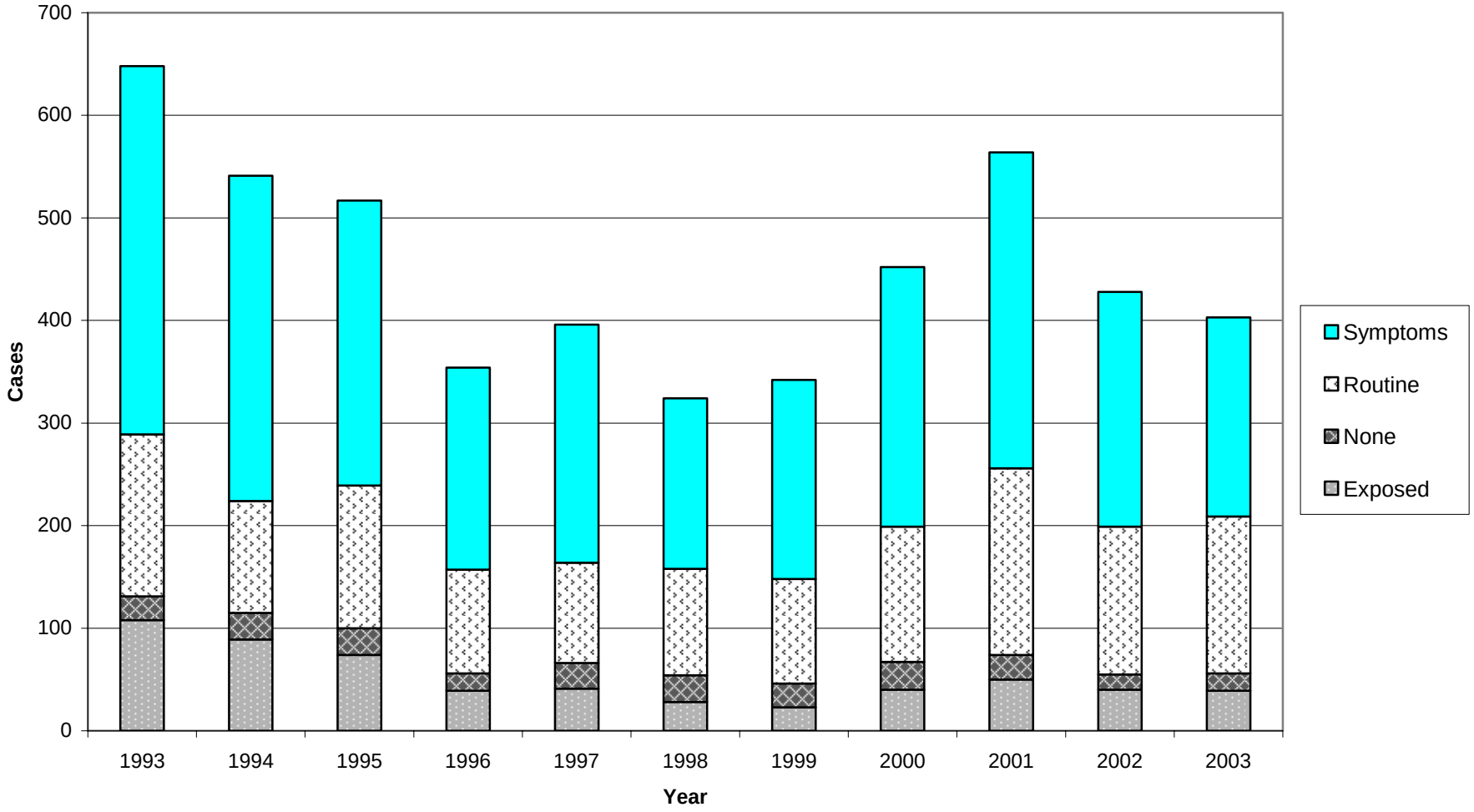
Figure 8: Gonorrhea Incidence by Age* Among Women
King County, WA, 1992-2003



* Cases with unknown age were distributed according to annual age distributions among cases with known age and included in age-specific rates.

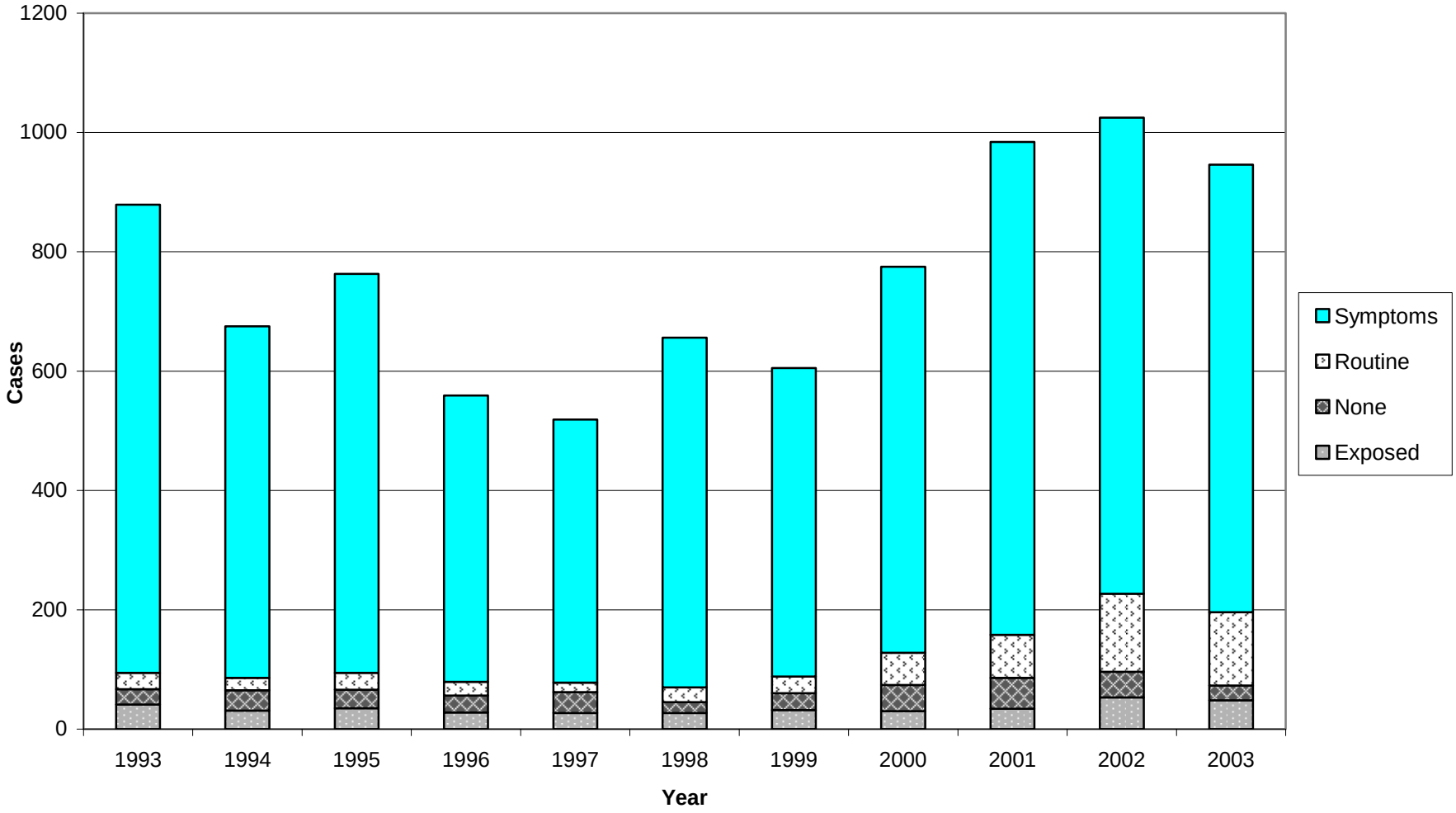
Figure 9: Gonorrhea Incidence by Race Among Women Ages 15-29
King County, WA, 1992-2003

Figure 10: Reason for Visit among Women Reported with Gonorrhea
King County, WA, 1993-2003



* Reason for visit is filled in by providers on the case report form.

Figure 11: Reason for Visit among Men reported with Gonorrhea
King County, WA, 1993-2003



* Reason for visit is filled in by providers on the case report form.

Syphilis

There were 82 cases of primary, secondary, and early latent syphilis reported in King County in 2003, for an overall rate of 4.6 per 100,000 residents (Table 9). Syphilis continued to be concentrated in the male population in 2003, with only 2 early syphilis cases occurring among women, compared to 80 cases among men. More specifically, syphilis was epidemic among MSM in King County, particularly among MSM with HIV (Table 10). In 2003, the incidence of syphilis in MSM was 176.1 per 100,000, while among MSM with HIV, the incidence was 905.2 per 100,000. In contrast, the incidence of syphilis among heterosexual men was 0.5 per 100,000 men.

Among persons diagnosed with early syphilis in 2003, 32.9% reported drug use, including ecstasy, crystal methamphetamine, cocaine, and poppers (Table 10). Over half reported having sex with anonymous partners, with 26.8% reporting use of bathhouses, and 19.5% reporting use of the internet to find sex partners.

The incidence of early syphilis has increased substantially in King County since 1996, when local syphilis transmission was eliminated from the county (Figure 12). Rates are approaching those seen in the late 1980s and early 1990s, when the syphilis epidemic in King County was fueled by crack cocaine use and commercial sex, primarily among heterosexuals. In 2003, the proportion of syphilis cases diagnosed in the early latent phase was also somewhat greater than it has been for most of the past decade (Figure 13).

Early syphilis in King County has been concentrated in MSM since 1998 (Figure 14); in the recent past before 1998, it had been found almost exclusively among heterosexuals. Figure 15 displays the incidence of syphilis over time among MSM, and heterosexual men and women. After an initial period of increasing rates among MSM from 1997 through 1999, the incidence of syphilis has increased sharply since 2001. Rates among heterosexuals have remained low and fairly stable since 1994.

Although HIV positive MSM have accounted for the majority of MSM syphilis cases in King County since 1998, the proportion of syphilis cases among MSM who were HIV negative or unknown status has increased from 30% in 1998 to 47% in 2003 (Figure 16). While syphilis incidence among HIV positive MSM was 10.9 times that among HIV negative men in 2003, this ratio has decreased from 23.7 in 1999 (Figure 17).

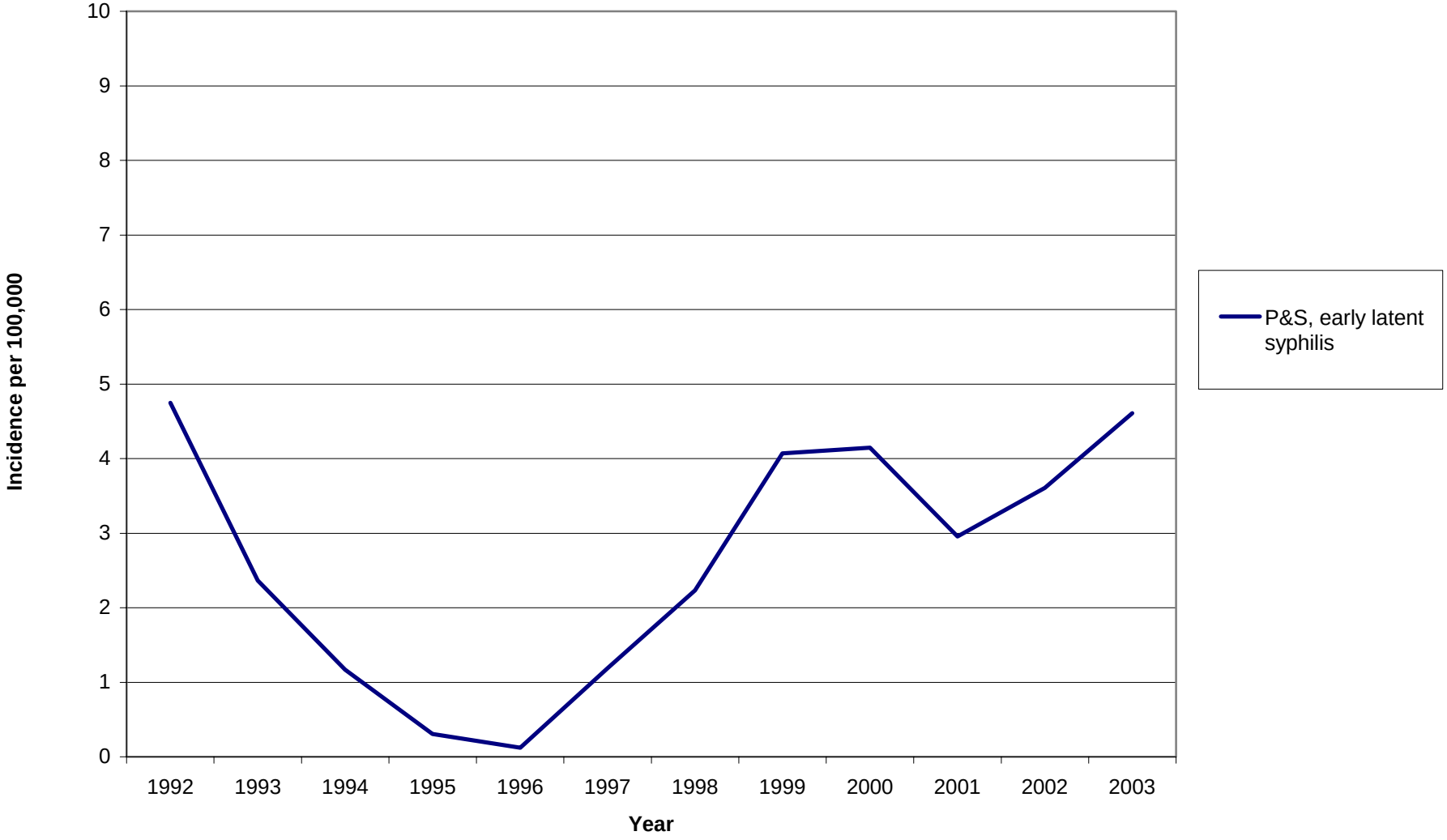
Table 9: Reported Cases and Incidence of Early Syphilis
King County, WA, 2003

		Cases	Percent	Incidence per 100,000 population
Sex				
	Men	80	0.98	9.0
	Women	2	0.02	0.2
Total cases		82		4.6

Table 10: Characteristics of Persons Reported with Early Syphilis
King County, WA, 2003

		Cases	Percent	Incidence per 100,000 population
Stage	Primary	19	23.2	
	Secondary	41	50.0	
	Early latent	22	26.8	
MSM (among men)				
	Yes	76	95.0	176.1
	No	4	5.0	0.5
HIV				
	Positive	41	50.0	734.6
	Negative	36	43.9	2.0
	Unknown	5	6.1	
HIV (among msm)				
	Positive	40	53.95	905.2
	Negative	33	43.42	85.2
	Unknown	3	2.63	
Risk Behaviors				
Drug Use	No or unknown	55	67.1	
	Yes	27	32.9	
Patient uses bathhouses				
	No	60	73.2	
	Yes	22	26.8	
Internet used to meet sex partners				
	No or unknown	66	80.5	
	Yes	16	19.5	
Anonymous sex partners during infectious period				
	No	36	43.9	
	Yes	46	56.1	

Figure 12: Incidence of Early* Syphilis
King County, WA, 1992-2003



*Includes primary, secondary and early latent cases.

Figure 13: Reported Cases of Primary and Secondary vs. Early Latent Syphilis
King County, WA, 1992-2003

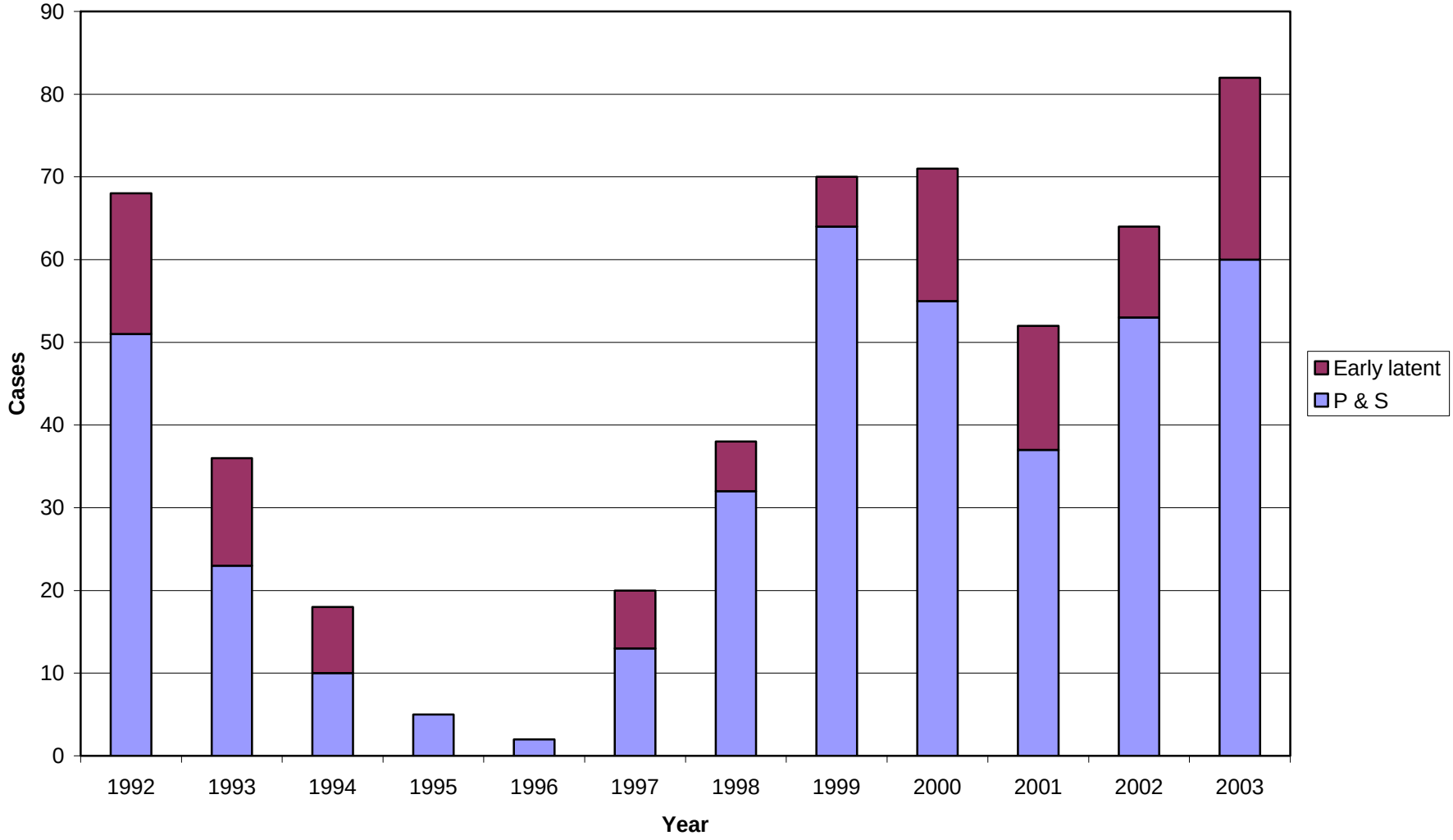


Figure 14: Early syphilis by Gender and Sexual Preference
King County, WA, 1992-2003

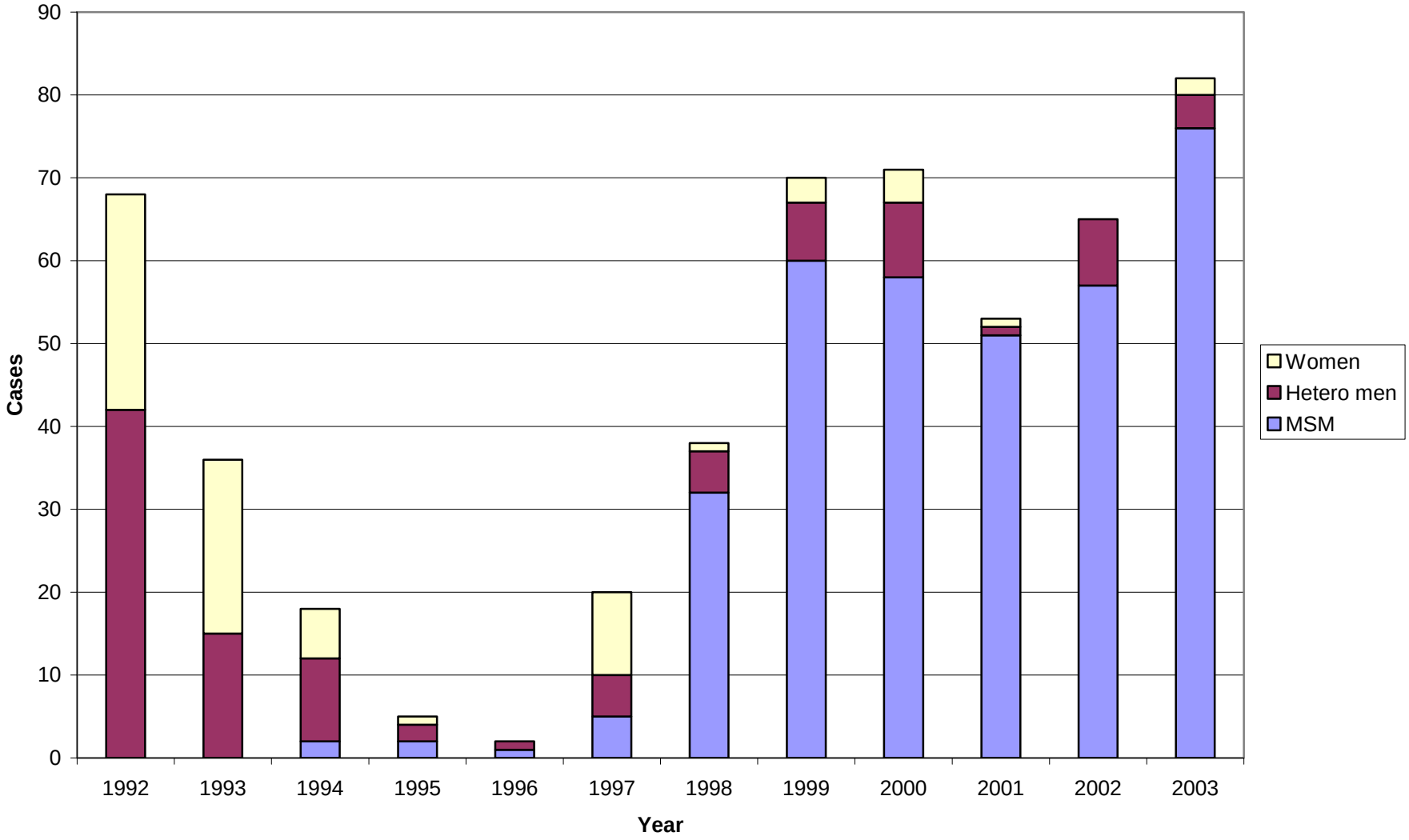


Figure 15: Early Syphilis Rates by Gender and Sexual Preference
King County, WA, 1992-2003

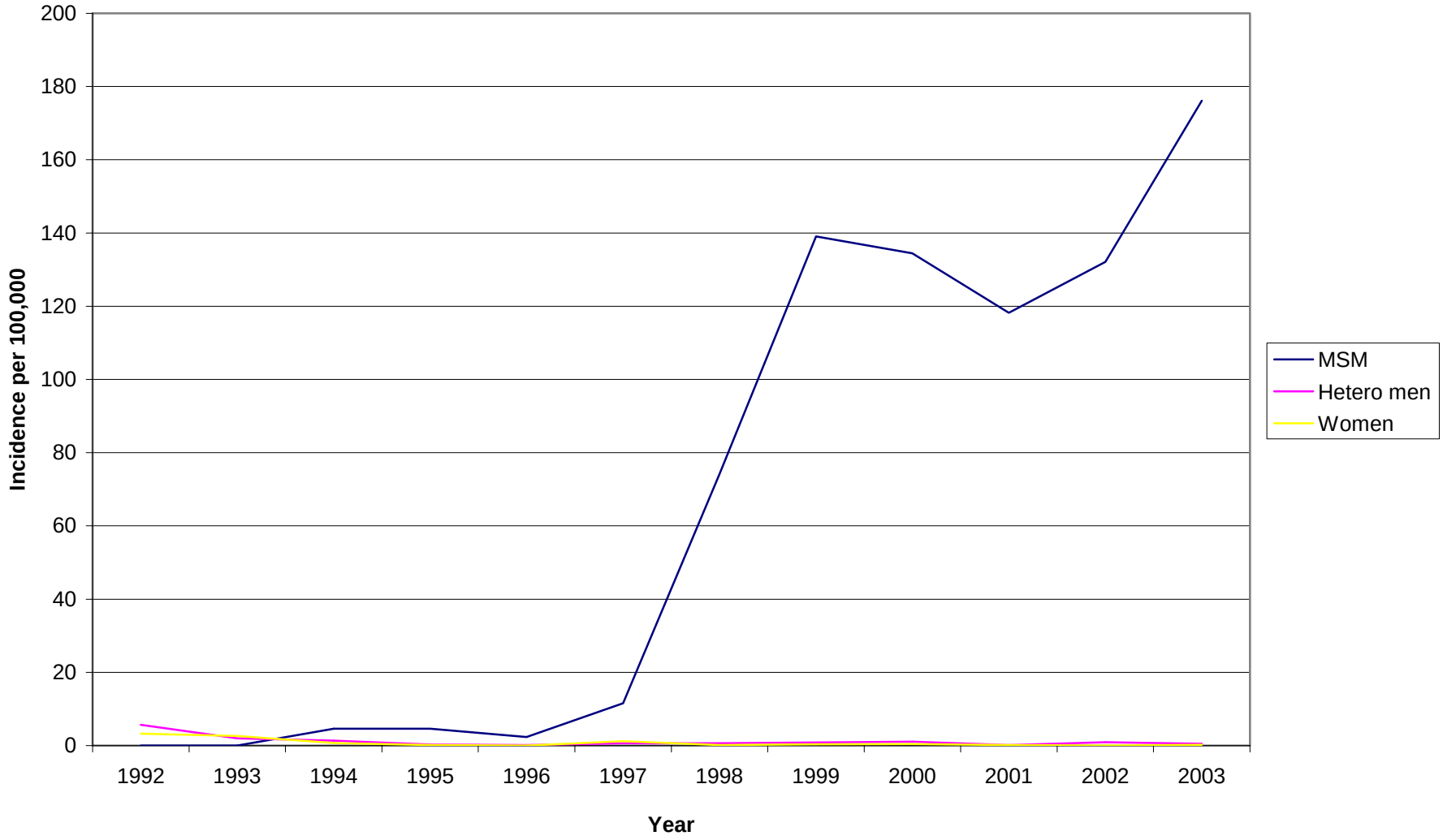


Figure 16: Percent of Early Syphilis Cases Among MSM by HIV status
King County, WA, 1997-2003

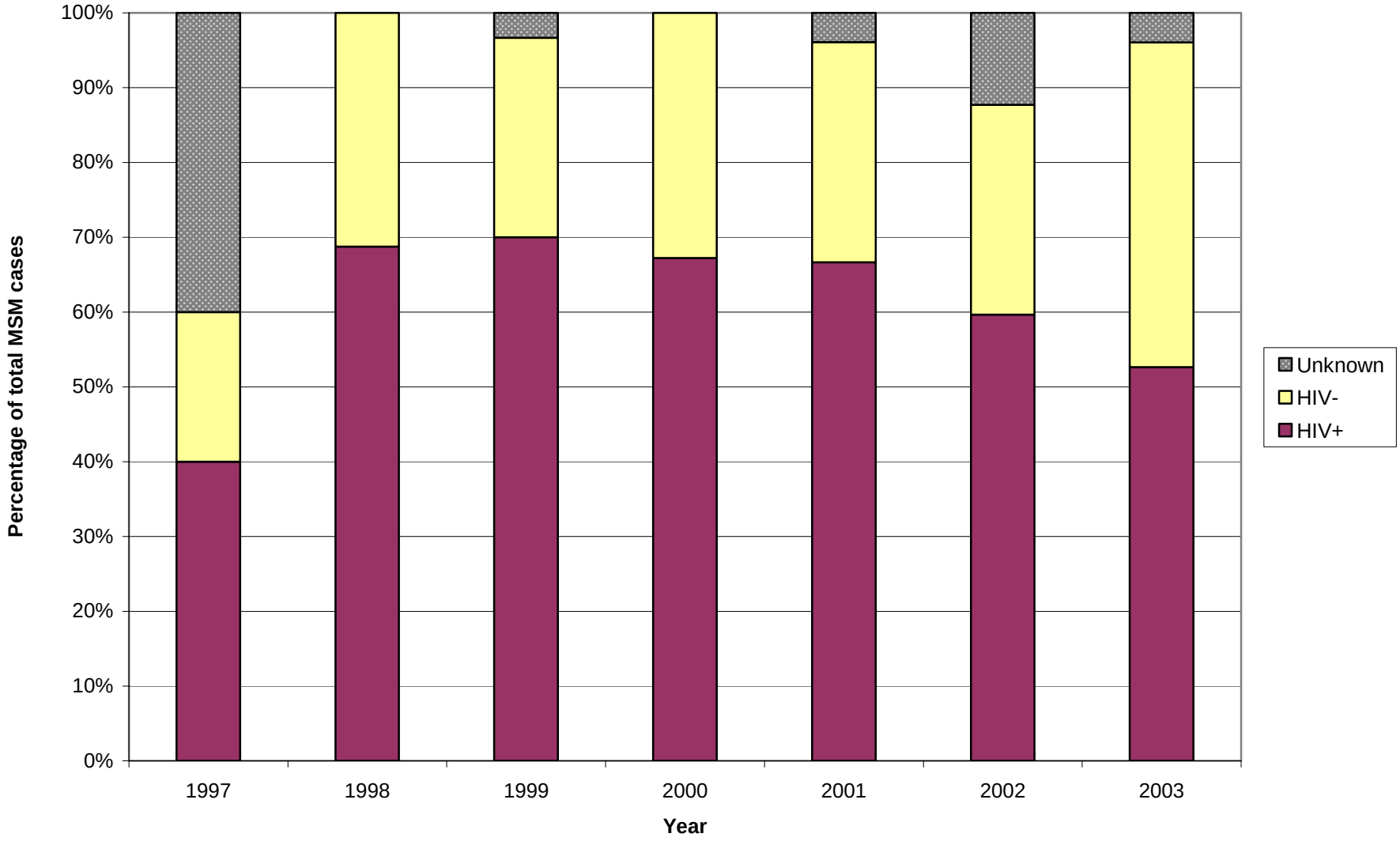
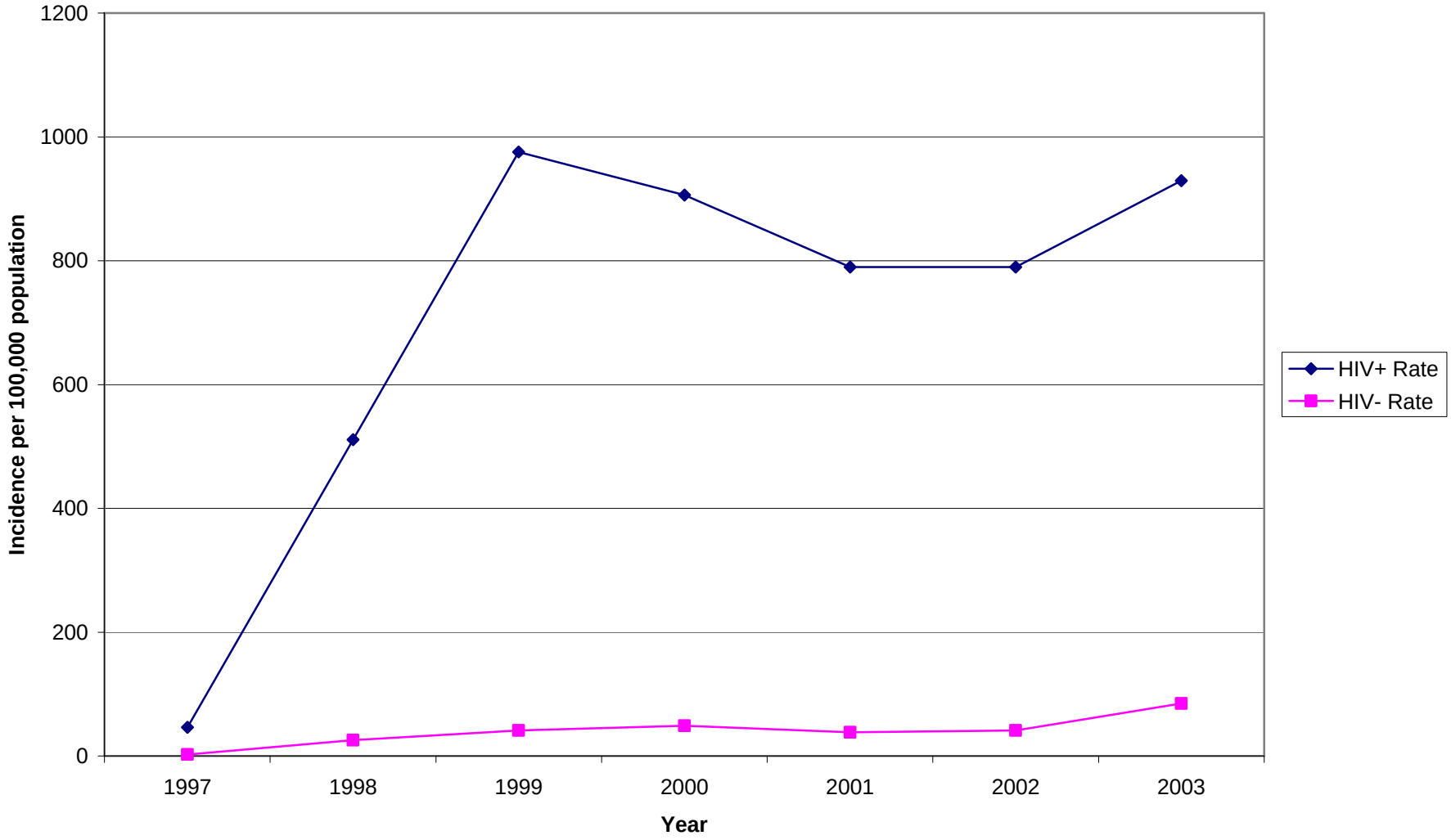


Figure 17: Early Syphilis Incidence by HIV Status in MSM
King County, WA, 1997-2003



Appendix A: Case Report Form